Subject: NIST NCSTAR 1 draft feedback
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I read the report and think the recommendations are excellent. Here are some notes I made as I read it. Some may be too specific or tactical to include in the recommendations, but am passing them along anyway.

- Removing the state law that prevents the use of stairwells during drills is a good first step, however this should go further and should highly recommend or require that full building evacuations should be practiced - have employees sign waivers if it is a liability issue. (we have seen landlords in other states not allow these drills due to the liability of someone getting injured.) It is important that employees be aware of egress routes. It is also important that employees be physically able to do the descent - this can be a challenge even for the fittest individuals descending from upper floors. The evacuation will be hampered by the slowest moving person ahead of the crowd in the stairway. Having a target evacuation time is an excellent idea and can be used to evaluate if improvements need to be made. The learning's from the full building evacuation in 1993 were instrumental in the safe evacuation of so many people from WTC1 and 2 and other buildings in the complex on 9/11.
- Require the provision of communication devices for floor wardens - including cell phones, pagers etc. This could be combined with pre-established communication groups using tools like Envoyworldwide tool - mass distribution of messages to email, office phone, cell phone call or text messaging. Many new technologies are now available and should be leveraged. A large percentage of employees now carry cell phones.
- Create an egress plan that prevents bottlenecks. If occupants of upper floors are using the same stairway exit routes as lower floors, stairways should get progressively wider the lower you go in the building. (building lobbies may become a bottleneck, create additional escape routes).
- Position stairways on all 4 corners of the building and two in the core of the building to maximize the separation of escape routes - total of 6 stairways (or more). Perhaps upper floors only need 4 stairways while on lower floors there may be 8 and up to 12 on the lowest parts of the building. Perhaps leverage scissor design to incorporate the stair traffic from the upper floors into the lower floor stairwells.
- Make sure all doors go to "fail-safe" mode in an emergency - this prevents employees becoming trapped in workspaces or public areas.
- Create removable escape hatches or trapdoors to bypass devastated floors, so occupants could drop onto the floor below. Office furniture could be positioned to create a ladder system / climbing blocks.
- Even though roof escape is not a primary evacuation option - why not allow doors to roof to be opened. It seems wrong to trap people inside. Having a supply of ropes and rappelling equipment available could potentially provide one more option??
- Recommend the use of elevators to evacuate when available unless it is obviously not safe to do so - especially for higher floors. Have procedures for when it is safe to use them and do drills. (e.g. max load - procedure to bypass floor when fully loaded to maximize the number of trips)
- Provide additional training around breaking vs. not breaking windows.
- Require that evacuation information be provided for visitors to buildings and all new employees undergo training on day1?.
- Use RFID sensors in buildings to monitor heat, detect anomalies, failures, etc. These should be used to gather critical data that could be of use to firefighters and occupants looking for a safe egress route. RFIDs could also be incorporated into floorwarden equipment to track progression of evacuation. These could also be used to record data should there be a full building failure.
- Create a new material that is used in conjunction with the fire retardant foam on the structural steel. This material when exposed to flame (due to the failure of the foam) would itself convert into a fire retardant. (similar to the way ash becomes an insulator)

Thank you for the opportunity to contribute. If you have any questions or further explanation, please feel free to contact me.

Regards,

Rob

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